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‘Vorgänger Darwins’ or ‘*Nachfolger Goethes*’? Wilhelm Bölsche on
Evolutionism in Goethe and Novalis or, Literature and the Two Cultures Then
and Now

Nicholas Saul

This essay is the first to consider Wilhelm Bölsche’s activity as editor of and commentator on Novalis’s work. It does so on the one hand by contrasting Bölsche’s image of Novalis with his image of Goethe, and on the other by setting that in the context of Bölsche’s evolutionist theory of culture. Both are said to represent evolutionism in an early and vigorous form, and so to ‘precede’ Darwin. Finally, Bölsche’s evolutionist characterisation of Novalis as a sympathetically Faustian conqueror of other cultures is critically evaluated against his own, later essay on the Conquistadors. Bölsche’s attempt to propagate an evolutionary critique of culture is in conclusion argued to prefigure key tendencies of today’s cognitive humanities and evolutionary poetics.

This paper has three linked cognitive interests. First, I want to talk about a figure from the *Jahrhundertwende*, Wilhelm Bölsche, who, if not wholly neglected, is traditionally marginalised in our official literary histories and contemporary practice,¹ even though that practice now thankfully often transcends the received canon. Second, recalling that Bölsche was a standard-bearer for what he would have called cultural Darwinism (but which we might prefer to call something else), I want to talk about his practice of writing popular literary history – of Goethe and Novalis – from this perspective, that is, from the perspective of a *Weltanschauung*² which diagnoses as a problem what C.P. Snow later called the two cultures³ and, when it judges literary productions, strategically seeks to apply unifying mediations of the allegedly opposing concepts of literature studies and science. Lastly I want to say

¹ A valuable introduction to man, work and recent scholarship is ‘*Was wir im Verstande ausjäten, kommt im Traume wieder*’: *Wilhelm Bölsche 1861–1939*, ed. by Gerd-Hermann Susen and Edith Wack, Würzburg, 2012; foundational is Alfred Herbert Kelly, ‘Between Poetry and Science. Wilhelm Bölsche as Scientific Popularizer’, unpublished doctoral dissertation, University of Wisconsin, 1975.

² See on the concept of *Weltanschauungsliteratur* around 1900 Horst Thomé, ‘Weltanschauungsliteratur. Vorüberlegungen zu Funktion und Texttyp’, in: *Wissen in Literatur im 19. Jahrhundert*, ed. by Lutz Danneberg and Friedrich Vollhardt, Tübingen 2002, pp. 338–80; also Todd Weir, *Secularism and Religion in Nineteenth-Century Germany: The Fourth Confession*, New York, 2014.

³ C.P. Snow. *The Two Cultures and The Scientific Revolution: The Rede Lecture 1959*, Cambridge, 1959. Responses to this include John Brockman, *The Third Culture*, New York, 1995 and Elinor S. Shaffer, *The Third Culture: Literature and Science*, Berlin, 1998.

something about what Bölsche – despite all due criticism – pioneered, which today has re-emerged and is again inspiring research in many arts faculties around the globe: evolutionist or cognitive approaches to literary study, which not only draw on our traditional sources of epistemological authority, humanistic and socio-cultural discourses, but also on the discourses of natural science.⁴ So that reading Bölsche in that sense at least might be of value to us.

A few words by way of introducing Bölsche. For a time at the turn of the century, there was a kind of alternative, faintly bohemian writers' colony in Friedrichshagen and Erkner around the Müggelsee to the south-east of Berlin. Willi Bölsche (1861–1939) was a leading member of this *Friedrichshagener Dichterkreis*, alongside the brothers Julius and Heinrich Hart, known for their radical advocacy of naturalist aesthetics in the journal *Durch!*, and the novelist, thinker and writer Bruno Wille. The brothers Carl and Gerhard Hauptmann were also associated. At this time Bölsche was a close friend of Lou Andreas-Salomé, and his influence on her biologicistic version of New Woman feminism is documented.⁵ Bölsche was a man of letters, who depended on his pen for his living. He wrote in several modes and genres. In literature, there are two early historical novels, *Paulus* (1885) and *Der Zauber des Königs Arpus* (1887), right at the end of that genre's fashionability, then a rather good contemporary social novel *Die Mittagsgöttin* (1891),⁶ which is a subtle treatment of the spiritualism phenomenon and shades from high naturalism, with celebrations of electric street lighting, the techno-sublime dynamism of steam locomotives and the quasi-Darwinian cellular macrostructure of mass urban existence, into genuinely aesthetic modernist meditations on the unconscious desires constituting the structure of the modern self, yet ultimately (as the title

⁴ An introduction to this is Karl Eibl, *Kultur als Zwischenwelt: Eine evolutionsbiologische Perspektive*, Frankfurt/Main, 2009.

⁵ See Ursula Renner, 'Lou Andreas-Salomé (1861–1937). 'Nicht nur Wissen, sondern ein Stück Leben', in *Frauen in den Kulturwissenschaften: Von Lou Andreas-Salomé bis Hannah Arendt*, ed. Barbara Hahn, Munich, 1994, pp. 26–42.

⁶ *Die Mittagsgöttin: Ein Roman aus dem Geisteskampfe der Gegenwart*, Stuttgart, 1891.

hints) turns out to emerge from the hypotext of Novalis's *Die Lehringe zu Sais*.⁷ There is also a lost, apparently almost complete science fiction novel, *Sternenfrieden*, which he claimed as his *opus magnum*, possibly a response to Kurd Laßwitz's novel of Martian invasion *Auf zwei Planeten* (1897).⁸

More significant than this strictly literary activity was perhaps his work as a publicist. Succeeding Otto Brahm, Bölsche from 1890 to 1893 edited the *Freie Bühne*, one of the chief Berlin organs of naturalist reflection.⁹ He was also a literary theoretician and editor, notably of Heine and Novalis,¹⁰ the latter of whom we shall be looking at in due course. Most important here is the slender programmatic volume *Die naturwissenschaftlichen Grundlagen der Poesie* (1887).¹¹ In it, Bölsche recognised what he elsewhere called the 'Macht der Naturforschung', the 'Einfluß der Naturwissenschaft auf unser modernes Denken',¹² that is, the authority of the discourse of natural science as dominant discourse of modernity, chief manifestation of culture of the two cultures. This work, however, contrary perhaps to expectations raised by its title, advocated anything but the one-dimensional enslavement of the aesthetic to the discourse of natural science (which, for example, writers like Zola had seemed to claim). Yes, Bölsche argues here, the artist must follow in his creation the new social and natural models of the world constructed by empirical science. Art was indeed to this extent a kind of servant discourse, an evolutionary technology in the service of the truths recognised by science. But only up to a point. Aesthetic discourse, claims Bölsche, is *also* epistemologically autonomous. As such it can disclose a bigger, more speculative picture of

⁷ See Nicholas Saul, 'Modernity's Dark Side. Wilhelm Bölsche: *Die Mittagsgöttin*. Darwinism, Evolutionary Aesthetics and Spiritualism' in: *Aesthetics and Modernity from Schiller to Marcuse*, ed. by Jerome Carroll, Steve Giles and Maïke Oergel, London, 2012, pp. 233–53.

⁸ See Rudolf Magnus, *Wilhelm Bölsche: Ein biographisch-kritischer Beitrag zur modernen Weltordnung*, Berlin, 1909, pp. 5, 115, 130.

⁹ See *Wilhelm Bölsche. Werke und Briefe: Wissenschaftliche Ausgabe*, ed. by Hans-Gert Roloff, *Briefe 1: Briefwechsel mit Autoren der Freien Bühne*, ed. by Gerd-Hermann Susen, Berlin, 2010.

¹⁰ *Heinrich Heines sämtliche Werke: Mit einer Biographie des Dichters und Einleitung von Wilhelm Bölsche*, 6 vols, Leipzig, 1887; *Novalis' ausgewählte Werke: Herausgegeben und mit Einleitung versehen von Wilhelm Bölsche*, 3 vols, Leipzig, 1903.

¹¹ *Die naturwissenschaftlichen Grundlagen der Poesie: Prolegomena zu einer realistischen Ästhetik*, Leipzig, 1887.

¹² Wilhelm Bölsche, 'Goethe und Haeckel', in: Wilhelm Bölsche, *Naturgeheimnis*, Jena, 1905, pp. 157–79 (169).

the world than that produced by scientific discourse under its truth conditions. This is the meaning of the frankly Romantic word ‘genius’, which for Bölsche even after Darwin applies to the artist’s (and indeed animals’) intuitive, but also physiological, ability to make creative, that is, adaptive leaps forward.¹³

Now if you are thinking that this move from natural selection to aesthetic genius romanticises the process of evolution, resolving the incipient two cultures problem by projecting into nature in the manner of an uncritical Kantian constitutive idea the notion of nature as creative artist of evolution, and of the artist as a kind of *natura naturans* in the second degree, then you are right. This leads us into perhaps Bölsche’s most influential field of activity. Bölsche was not only a monist, but also a socialist utopian, and like Bruno Wille devoted a good deal of his time to addressing workers’ associations with improving talks about literary and scientific culture, in an age, let us recall, when in the wake of the *Kulturkampf* the teaching of biology, let alone evolution, had been banned from German schools. The two Goethe texts we shall be looking at arise from this field of his activity, and from one of them stem the quotations in my title. Most important here are Bölsche’s popular scientific works. There is a huge two-volume history of natural science *Die Entwicklungsgeschichte der Natur* (1894–1896),¹⁴ destined for the living rooms of the Prussian *Bildungsbürger*. More important, there is his radical three-volume *Das Liebesleben in der Natur. Eine Entwicklungsgeschichte der Liebe* (1898–1903),¹⁵ targetted uncompromisingly at intellectuals. This ambitious work, opulently produced by Diederichs with elaborate and beautiful art nouveau illustrations, confronted what for Bölsche was the crisis of modern post-Darwinist culture, and attempted to provide a solution.

¹³ Cited here from Wilhelm Bölsche, *Die naturwissenschaftlichen Grundlagen der Poesie: Prolegomena zu einer realistischen Ästhetik. Mit zeitgenössischen Rezensionen und einer Bibliographie der Schriften Wilhelm Bölsches*, ed. by Johannes J. Braakenburg, Munich, 1976), pp. 1–65 (33, 54–5).

¹⁴ *Entwicklungsgeschichte der Natur*, 2 vols, Neudamm, 1894–6.

¹⁵ *Das Liebesleben in der Natur: Eine Entwicklungsgeschichte der Liebe*, 3 vols, Florence, 1898–1902. On this complex Nicholas Saul, ‘Darwin in German Literary Culture 1890–1914’, in: *The Literary and Cultural Reception of Charles Darwin in Europe*, ed. by Thomas F. Glick, Elinor Shaffer, 2 vols, London, 2014, I, pp. 46–77, 344–350.

It was a crisis of meaning. There had been a master narrative of meaning in occidental culture. That was provided, still, up to the end of the eighteenth century, until the rise to prominence of Strauß, Feuerbach, and others, by the Bible and the Judeo-Christian tradition. Now, however, following the rise of empirical natural science, that foundational narrative had been discredited. There was of course a replacement, *another* story of the origin and development of life, endowed with the modern version of unchallengeable epistemological authority: Darwin's *Origin of Species* (1859). But *as* master narrative Darwin's story was in one respect a sad disappointment. It offered no alternative meaning. It displaced humanity from its throne at the apex of creation. It dismissed as superfluous any suggestion that life originated from divine intervention. It posited (of all things) random variations in heritable material and existential struggle as key causal factors in the process of selective adaptation. Natural selection thus had no teleological direction. Adaptation and survival were the criteria of success, regression to lesser complexity and sophistication just as successful as progression. Evolution, our story, quite literally, is going nowhere in particular, is unclosed and unclosable, is at best a sort of instrumental end in itself. Thus *Das Liebesleben in der Natur* is a *relecture* of the newly-triumphant, yet in this sense deficient, Darwinian master narrative,¹⁶ reinterpreting the story of the origin and a-teleological development of life as the origin and progressive development of a principle of erotic love for a modernist generation desperate for compensatory meaning.

The dramatic loss and then recovery of self characteristic of the experience of love, Bölsche argues, is evidenced objectively at the very beginning of life, in the self-division of single-celled organisms, in the emergence of reproduction by sexual dimorphism, and ultimately in the totalising aesthetic representation of the bond of all living things with all living things. It was Bölsche's account here of the emergence of sexual reproduction in *Das Liebesleben in der Natur*, from the process of asymmetric cell-division to recombination of

¹⁶ Compare the recent *relecture* of Darwin, and sexual selection in particular, by Elizabeth Grosz: *Becoming Undone: Darwinian Reflections of Life, Politics and Art*, Durham, NC, 2011.

functionally distinguished dimorphic elements, which decisively influenced Andreas-Salomé's account of gender in her would-be emancipatory philosophy of the New Woman in her *Der Mensch als Weib* (1899).¹⁷ Bölsche's book, with its consolatory re-writing of classical Darwinian evolutionary history as the neo-Romantic self-becoming of love, was indeed read as a devotional text. In this, it is the culmination of Bölsche's strategic attempt to bridge the gap between the two cultures as a key cultural issue of modernity. As its publication history attests, it was a colossal success. The first edition comprised no less than 30,000 copies. Another edition of 50,000 followed by 1909. By Alfred Kelly's calculation Bölsche sold around 2.7 million copies of his works, no less, during his lifetime.¹⁸ Bölsche, then, was a bestselling writer, a hugely successful innovator in popular scientific writing, precursor of Richard Dawkins, Mark and Matt Ridley and Stephen Pinker, and in that lies not his smallest claim on our attention.

In the second part of my paper I want to look by way of case studies at Bölsche's attempts to integrate Goethe and Novalis into his aesthetic monist *Weltanschauung*. My main interest here is actually Bölsche's reception of Novalis. But Goethe plays a role, because Bölsche, like many apologists of other marginalised cultural figures in Germany, often uses a postulated affinity and community of interest between Goethe and Novalis to defend Novalis. Thus, clearly as part of a strategy to ward off commonplace attacks in the Hegelian, realist-pragmatic style on Novalis's alleged constitutional otherworldliness,¹⁹ he speaks unexpectedly of 'der Goethe-Zug an Novalis', glossed as Novalis's 'sicherer Sinn für

¹⁷ On this Brigid Haines, 'Masochism and Femininity in Lou Andreas-Salomé's *Eine Ausschweifung*', in *Women in German Yearbook: Feminist Studies in German Literature and Culture*, 10 (1995), 97–115; Gisela Brinker-Gabler, *Image in Outline: Reading Lou Andreas-Salomé*, New York, 2012, pp. 24–27, and Nicholas Saul, "'... Das normale Weib gehört der Zukunft': Evolutionism and the New Woman in Leopold von Sacher-Masoch, Frieda von Bülow and Lou Andreas-Salomé', in *The Feminine in German Culture*, ed. by Sarah Colvin and Charlotte Woodford, special issue of *GLL*, 67/4 (2014), 555–73

¹⁸ Compare *Ernst Haeckel-Wilhelm Bölsche. Briefwechsel 1887–1919*, ed. by Rosemarie Nöthlich, 2 vols, Berlin, 2002–2006, I (2002), pp. 134, 135, 157, 165, 169, 212, 232; also Olaf Breidbach, 'Bemerkungen zu Wilhelm Bölsches Bedeutung für die Popularisierung der Naturwissenschaften', in *Was wir im Verstande ausjäten*, pp. 225–46 (pp. 225–26); Kelly, pp. 190–91.

¹⁹ See on this *Realism and Romanticism in German Literature*, ed. by Dirk Göttsche and Nicholas Saul, Bielefeld, 2013, especially Göttsche and Saul, 'Introduction', pp. 9–30.

Wirkliches, seine Fassungsgebe und sein unablässiger Drang nach Wissenserweiterung’;²⁰ Novalis ‘kam aus der Schule Goethe’s’, he says elsewhere.²¹

But who is this Goethe now? We can find this out from two works on Goethe by Bölsche I now want to examine. The first, *Goethe im 20. Jahrhundert* (1901),²² was originally an address, delivered in Goethe’s honour on his 150th birthday in his birthplace, Frankfurt am Main (1899, then), as Bölsche proudly reports, or claims, as a free improvisation to over 2000 members of the Frankfurter Arbeiterschaft (‘Vorwort’, *Goethe im zwanzigsten Jahrhundert*, p. 5). It was repeated on 2 September 1900 in developed form before the Festversammlung des *Giordano Bruno-Bundes für die einheitliche Weltanschauung* (one of the associations promoting philosophical monism around this time) in Berlin, this time to a mere 1200 listeners (‘Vorwort’, p. 5). The second is another pamphlet, *Die Eroberung des Menschen* (also 1901), in some editions knowingly subtitled *Eine Sylvesterpredigt zum neuen Jahrhundert*,²³ and also stressing the centrality of Goethe’s work and personality for the coming age.

Turning to *Goethe im 20. Jahrhundert* let us note that this is a laudation, epideictic speech. Thus we hear that Goethe is for Germans in the dawning century a myth, a hero, a colossus, the worthy object of an authentic ‘Heroen-Kultus’ (*Goethe im zwanzigsten Jahrhundert*, pp. 8, 11-12), fit to be named in one breath with the Buddha, Christ, Homer, Socrates, emblem of the emergent collective spirit, ‘gewissermaßen der nächste Glaubenspunkt für unser letztes Evangelium, das Evangelium vom großen, aufsteigenden Geistesindividuum Menschheit’ (p. 11), model of a new phase of human development to which we now aspire. He is this, because he is the culmination of the previous cultural evolutions of human history, from the birth of

²⁰ See Wilhelm Bölsche: ‘Friedrich von Hardenberg, genannt Novalis’, in: *Novalis’ Werke*, ed. by Wilhelm Bölsche, 3 vols, Leipzig, 1903, I, pp. IV–XLVII (XXVII).

²¹ See Wilhelm Bölsche ‘Novalis und das neue Jahrhundert’, in *Deutsche Rundschau*, 101 (October–December 1899), 188–192 (191).

²² *Goethe im zwanzigsten Jahrhundert: Ein Vortrag von Wilhelm Bölsche*, Berlin, 1901.

²³ *Die Eroberung des Menschen*, Berlin 1901; compare the titles in Braakenburg’s critical bibliography, p. 106. The new year’s sermon of course functionally exploits the temporal juncture by exhorting the Christian to begin a new phase of life. There were actual, devotional Goethe sermons at this time. See Julius Burggraf, *Goethepredigten*, Gießen, 1913.

the notion of humanity in India, to its initial unfolding in Greece, the universalisation of that idea in Rome and its religious inflection in Christianity, and the secularisation of that thought in the Renaissance. Bölsche impishly notes in this context that one of Raphael's familiar putti from the Sistine Madonna looks just like a baby Goethe, as if in anticipatory divination of Goethe's advent (see Figure 1).



Figure 1: Raphael, Putti (detail from the Sistine Madonna, 1512–13)
(Public domain: [http://commons.wikimedia.org/wiki/File:Sanzio,_Raffaello_-_Putti_\(Madonna_Sistina\)_-_1512-1513.jpg](http://commons.wikimedia.org/wiki/File:Sanzio,_Raffaello_-_Putti_(Madonna_Sistina)_-_1512-1513.jpg))

Thus humanity experiences its highest refinement so far in Goethe himself, as the embodiment of a notional maximum development of human perfection. Taking up Haeckel's image of evolution as a tree (see Figure 2), Bölsche calls Goethe the newest, greatest ring of the tree of humanity (*Goethe*, pp. 21-22), more than mere culmination, rather encompassing all previous manifestations of the human and drawing their sum, self-conscious of his place in this development (*Goethe*, pp. 24-25). In short, rather as for Haeckel in his famous

biogenetisches Grundgesetz, ontogeny recapitulates phylogeny,²⁴ the development of the individual Goethe recapitulates the development of the genus so far. In this sense Goethe is the first truly historical human being.

²⁴ See for example Ernst Haeckel, *Die Welträthsel. Gemeinverständliche Studien über Monistische Philosophie*, Stuttgart, 1899, p. 36.



Figure 2: Haeckel's tree of mammalian life progression (*Generelle Morphologie*, 1866, II, Figure VIII) (Public domain: <https://archive.org/details/generellemorphol02haec>). Goethe would for Bölsche be emergent in the top right-hand corner.

All that, however, is merely hyperbole. What matters, says Bölsche, is the content (*Goethe*, p. 29). And this is where Darwin comes in explicitly for the first time. For Goethe's greatest achievement, his 'Lebensgedanke' (p. 29), is that of 'eine *natürliche Entwicklung*' (p. 29) – the contemporary German term for Darwinian evolution –, 'eine unablässige, sich steigernde Entwicklung' (29) of all things – a thought we know of course from the essay esteemed and studied, if not actually written, by Goethe: 'Die Natur'.²⁵ This it is which makes Goethe not just a ring on the Haeckelian tree of life, but – and Bölsche here strategically collapses the difference of nature and culture – a new branch, 'weit mehr, als bloß ein Jahresring im Stamm der Menschheit. Durch [den Lebensgedanken] ist [Goethe] zugleich ein grüner Sproß an diesem Baume. Mit ihm hat er eine neue Kulturepoche begründet' (p. 30), a new evolutionary phase or new type of the species. In this achievement Goethe is nothing less than a 'Vorgänger Darwins' (30).

Now this, however oddly it may strike us – and quite apart from the many who claim Lamarck or Wallace or others as the true discoverer of the theory of evolution before Darwin – is actually quite a conventional monist assertion in the late nineteenth century and indeed in recent twenty-first scholarship.²⁶ As Bölsche himself notes at this point, his friend and ally in the monist cause, the soon-to-be Anti-Pope of the Monist Church, Ernst Haeckel, had in his standard and much-reprinted *Generelle Morphologie* (1866),²⁷ explicitly claimed Goethe (the *Metamorphose der Pflanzen*) on this basis both as Darwin's precursor (*Generelle Morphologie*, II, 23) and as a thoroughgoing monist and therefore precursor of Haeckel himself (*Generelle Morphologie*, II, 449). Indeed this position crossed opposing schools of

²⁵ See FA II. 2, pp. 477-9; also 'Erläuterungen zu dem aphoristischen Aufsatz "Die Natur"', FA XVIII, pp. 358-360.

²⁶ See Robert J. Richards, *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe*, Chicago, 2002; also Angus Nicholls, 'On Science and Subjectivity', in *History of the Human Sciences*, 18/1 (2005), 143-158.

²⁷ Ernst Haeckel, *Generelle Morphologie der Organismen: Allgemeine Grundzüge der organischen Formen-Wissenschaft, mechanisch begründet durch die von Charles Darwin reformirte Deszendenz-Theorie*, 2 vols, Berlin, 1866.

opinion. Hermann von Helmholtz, Rector of Berlin University, no doubt one of the most respected and influential scientists of his age and certainly no monist, explicitly acknowledged Goethe as Darwin's precursor in an epilogue of 1875 to an 1853 essay otherwise critical of Goethe's scientific achievements.²⁸ Nor should we forget that such judgements, hyperbolic as they may sound, actually came hedged around in both Haeckel and Bölsche already²⁹ with qualifications and concessions as to the actual quotient of originality to which Darwin in truth lays sole claim (adaptation, struggle, the process of selection itself, the relation of individual and species, the transformation of species, and so forth – little or none of this is in Goethe). Nevertheless, here we have it: Haeckel and Bölsche are also in the vanguard of the key move Mandelkow identifies in the late nineteenth-century reception history of Goethe, the foregrounding of his natural science as his most significant achievement; now applied not only, as Mandelkow saw, to the interpretation of his literary writings, but also to natural science *schlechthin*, and conferring his cultural prestige on the controversial Darwinian project.³⁰ Equally, Goethe is seen as someone who, in the age of Dilthey's distinction between the humanities and the natural sciences as disciplines of subjective understanding and objective explanation respectively,³¹ makes no such two cultures distinction, so that the monist project is also hallowed by Goethe's cultural nimbus.

Bölsche however, goes a step further even than Haeckel, and perhaps a step too far. In truth, he says, we have got the emphasis wrong in the retelling of our new master narrative. It is not Goethe who is the precursor of Darwin, rather Darwin, Haeckel, and all the rest are in

²⁸ 'Ueber Goethe's naturwissenschaftliche Arbeiten' (1853), in Hermann von Helmholtz, *Popularwissenschaftliche Vorträge*, 1. Heft, Braunschweig, 1876, pp. 31–53, 'Nachschrift', p. 54.

²⁹ By contrast with Richards (note 28), p. 534. Compare Bölsche: 'Goethe und Haeckel, (note 13), p. 164; also Timothy Lenoir, 'The Eternal Laws of Form: Morphotypes and the Conditions of Existence in Goethe's Biological Thought', in: *Goethe and the Sciences: A Re-appraisal*, ed. by F. Amrine, F. J. Zucker, and H. Wheeler, Dordrecht, 1987, pp. 17–28.

³⁰ See Karl Robert Mandelkow, *Goethe in Deutschland: Rezeptionsgeschichte eines Klassikers*, 2 vols, Munich 1980–89, I, 187–88.

³¹ See Wilhelm Dilthey, *Einleitung in die Geisteswissenschaften: Versuch einer Grundlegung für das Studium der Gesellschaft*, in Dilthey, *Gesammelte Schriften*, ed. by Bernhard Groethuysen, 26 vols, Leipzig, 1914–2006 (vols 13–26 published Göttingen), I (1922), pp. 368–69, 373.

fact ‘*Nachfolger Goethes*’ (Goethe, p. 31). Immanent development of the monistic *Gott-Natur* to perfection is the highest law (48-51), and even Darwin’s achievement belongs in a subordinated position in this story, not vice versa. Turning now to culture, Faust in his principle of ideal striving, ruthless and guilt-free though that be, is the embodiment of model evolutionary development (pp. 32-39). Bölsche ends with the idea that we must all aspire to become the ideal type of Goethe, at which point the crypt in Weimar will mysteriously become empty (p. 57), Goethe thus becoming the secular fulfilment of Christ, whose second coming this modernist sermon proclaims.

We need dwell less on *Die Eroberung des Menschen*. If *Goethe im 20. Jahrhundert* identified Faust’s striving as the *modus operandi* of humanity in the new evolutionary epoch, then this text, whilst it sidelines Goethe (*Eroberung*, pp. 8-9), narrows the focus to one particular type of Faustian striving: conquest, the historical conquest by humanity of itself (*Eroberung*, p. 5) in the nineteenth century. There are three stages, says Bölsche. The first is the discovery of human embryology, the understanding through microscopy of the making of new individuals. The second is the discovery of deep time by Lyell, and of the origin of humanity as species therein. The third is of course Darwin’s particular theory of the origin and transmutation of species (pp. 37-38) through deep time, and the seamless inner continuity of all life. It is now the task of humanity to grasp what this system of universal filiations means for the future. All this, says Bölsche, does not diminish, but raise the dignity of nature, in that even the most primitive single-celled organisms can be argued to contain human potential (p. 46); and even matter on these premisses must somehow contain intellect (p. 50). What is left – and Bölsche’s two examples are a theologian and a gorilla – , will necessarily struggle for supremacy and lose out in the evolutionary process (51-52).

Thus here at last we come to Bölsche’s evolutionary version of Novalis. If Goethe was marginalised in *Die Eroberung des Menschen*, Novalis makes here an unexpected if brief guest appearance. Which thinkers before Darwin, speculates Bölsche, could have conceived

of the evolutionary path of humanity as passing not merely through descent from apes, but through all creatures, regardless of how alien their appearance might be? It is indeed Novalis:

Ein Inder hätte vielleicht zugnickt, er, der die Welt aus einer roten Lotusblüte steigen sah.
Ein Romantiker vom Schlage des Novalis, der den Stein beseelte. Aber die Ahnungen dieser beiden hätten noch jahrtausendlang durch die Welt wandern können ohne andere Wertung als die einer schönen Dichtung (*Eroberung*, p. 38)

Novalis too, then, is at least potentially a ‘Vorgänger Darwins’, and perhaps Darwin is by the same token not only a ‘*Nachfolger Goethes*’, but also a successor to Friedrich von Hardenberg.

Bölsche seems to have been particularly fascinated by Novalis. There is nothing unusual about that. Around this time, of course, there was a general awakening of interest in Novalis’s work, as the mindset of the *Jahrhundertwende*, jaded by a century of grim pragmatic realism, recognised its transhistorical affinity with his declared aestheticism, his focus on subjectivity and sensitivity to liminal states of consciousness, and his determined philosophico-poetic attempts to think, represent, and generate a utopian holistic, spiritualised and healed universe. An encounter with Novalis seems to have belonged to the standard repertoire of rites of passage for any ambitious poet around 1900, notably of course Hofmannsthal.³² His papers were after a century of enclosure gradually being made accessible by the Hardenberg family, and there were repeated calls by such as Oskar Walzel and Jakob Minor for new editions of the *Schriften*, originally compiled by Friedrich Schlegel and Tieck, and supplemented by Eduard von Bülow with fragments in 1846, but since then unchanged.³³ It can likewise hardly

³² See Nicholas Saul, ‘Hofmannsthal and Novalis’, in: *Fin de siècle Vienna*, ed. by Gilbert J. Carr, Eda Sagarra Dublin 1985, pp. 26–62.

³³ *Novalis. Schriften*, ed. by Friedrich Schlegel, Ludwig Tieck and Eduard von Bülow, 3 vols, Berlin 1802–1846. An authoritative overview of the edition history is *Novalis: Das Werk und seine Editoren: Katalog zur*

be surprising that the first attempt to satisfy the new demand emerged from Friedrichshagen. Bruno Wille provided the introduction to a three-volume edition by Carl Meißner in 1898³⁴ for Diederichs (inevitably), which, to the disappointment of all concerned, limited itself to reproduction of the original edition of 1846. There followed, however, Ernst Heilborn's pioneering and today well-regarded edition of 1901 with Reimer, the original publisher, which for the first time included some new fragments, in chronological-thematic order, and above all compared the edited texts with the original MSS.³⁵ And, in response, in the same year, Wille added to the Meißner edition a supplementary volume containing the new fragments published by Heilborn.

All this activity seems to have suggested a further opportunity to Bölsche. He had published a long review of the 3-volume Meißner-Wille edition in Julius Rodenberg's *Deutsche Rundschau* in 1899,³⁶ had recycled this, taking account of the supplementary volume in his collection of programmatic aestheticist essays *Hinter der Weltstadt* (1904),³⁷ and in the meantime had produced his own 3-volume edition of *Novalis' Werke* with Max Hesse, taking account of the new material found by Heilborn, in 1903.³⁸ Thus Bölsche's main contribution to Novalis reception around 1900 is his lengthy biographical appreciation of Hardenberg to introduce this set, and his brief introductions to each volume, to which I now turn. For this is decidedly a Novalis who emerges from Bölsche's own project and its publicistic strategies of persuasion: a Novalis in the shadow of Darwin in the shadow of Goethe.

Ausstellung, ed. by Gabriele Rommel, Forschungsstätte für Frühromantik und Novalis-Museum, Schloss Oberwiesendahl 2001.

³⁴ *Novalis. Sämtliche Werke*, ed. by Carl Meißner., introduced by Bruno Wille, 3 vols, Florence, 1898. *Ergänzungsband auf Grund des literarischen Nachlasses*, ed. by Bruno Wille, Leipzig, 1901

³⁵ *Novalis. Schriften: Kritische Neuausgabe auf Grund des handschriftlichen Nachlasses*, 3 vols, by Ernst Heilborn, Berlin, 1901. See on this: Ira Kasperowski, 'Ernst Heilborns Ausgabe der "Schriften" zum 100. Todesjahr von Novalis (1901)', in Rommel (ed.), *Novalis. Das Werk und seine Editoren* (note 24), pp. 47–64.

³⁶ See note 22.

³⁷ Wilhelm Bölsche, 'Ein Wort zu Novalis', in W.B., *Hinter der Weltstadt: Friedrichshagener Gedanken zur ästhetischen Kultur*, Jena 1904, pp. 23–36.

³⁸ See note 21. Hereinafter referred to as *Bölsche Novalis*.

Bölsche's Novalis, initially at least, is not without familiar features. He is the poet of yearning and distilled quintessence of Orphic lyricism (Bölsche, *Novalis* I, III). He is of course inhabited by the absolute conviction that poesy is reality, the highest reality, and unconditionally embodies truth: 'Die Kunst unsere erste, tiefste, reinste Erkenntnisquelle' (p. IV). Hence his notion of poesy extends in what seems a familiar way to encompass reality. The poet is 'der oberste der Forscher' (p. IV). In the sense of the ideal, the poet is 'der Normalmensch' (p. IV), he stands 'an der Spitze der Kultur' (p. IV). But Novalis's project is for Bölsche more than this, evidently still insufficiently theorized, construction of it. He is in fact rather like a miniature version of Goethe. If Goethe in his long life begins in the eighteenth century and, changing himself, extends into the radically changing world of the nineteenth, Novalis, thanks to his short life, is perched on the cusp of the tipping point from the eighteenth to the nineteenth centuries (p. V). He is thus constitutionally ambiguous, like Goethe a mirror of his age, a microcosmic representative of the great opposing tendencies of the (macro-) epoch, all of which are concentrated in his person and work:

Von allen Figuren der großen Goethe-Epoche ist er am ausgesprochensten die auf der Grenze des achtzehnten und neunzehnten Jahrhunderts. Abendrot liegt in ihm und Morgenrot zugleich. In diesem magischen Doppelglanze steht er wie in eine künstliche Glut getaucht. Kurz ist sein Leben und doch scheinen zwei ganze Jahrhunderte darin. Eine über alle Maßen konzentrierte Gestalt ist er, gekrönt und bisweilen auch etwas gedrückt von der Fülle seiner Stunde. (p. V)

Hence these dual tendencies of the age must in Novalis remain eternally unrealised and a fragment. Thus just as Goethe grew from a narrow existence as an eighteenth-century poet into the nineteenth-century world of harsh, realistic natural science, so too, if only as a snapshot (and Bölsche does say 'Momentphotographie' (p. VII)), Novalis. So it is that in

addition to the unconditional ideology of poesy as world-colonising truth and reality, Novalis's realism, his natural-scientific studies and practical work are now radically foregrounded by Bölsche: 'sein sicherer Sinn für Wirkliches, seine Fassungsgabe und sein unablässiger Drang nach Wissenserweiterung' (p. XXVII). Novalis, student of chemistry and mining science at Freiberg, in fact breathes the atmosphere 'des anbrechenden Zeitalters der Naturforschung' (p. V), shares its 'physikalische, mechanistische Weltauffassung' (p. V). In him lies '[e]in unersättlicher Durst nach Aneignung von "Tatsächlichem"' (p. XXVI), indeed precisely this nineteenth-century appetite is what distinguishes him from Friedrich Schlegel and other, less significant Romantics (p. XXXIX). But – in this also like Goethe – even this anti-speculative, empiricist recognition of the emergent age of science is for Novalis in the last analysis framed by his fundamental aestheticism. Even at the dawn of the age of science he intimates the end of the mechanistic natural philosophy and the eventual rise of spiritualised concept of nature (p. V): Bölsche's own views, of course. In this sense, then, recalling Haeckel's foundational metaphor and the notion of Novalis as divinatory precursor of Darwin, we at last find 'die Blaue Blume sich auswachsend zum Lebensbaum, unter dem die Völker wohnen' (IV).

But this emphasis on the scientist Novalis, interesting as it may be – and indeed it is an anticipation of one of the major postwar strands of research in Novalis Studies –,³⁹ is not my chief point. The most striking feature of Bölsche's reconstructed Novalis is not his function in Bölsche's private mythology as Goethe's miniature epigone and consequent suitability for insertion into the grand narrative of Bölsche's eroticist *relecture* of Darwin. Rather, it is his evolutionary striving. Gone is any Tieckian or nineteenth-century sense of Novalis's otherworldliness, even escapism. Rather, Bölsche's Novalis has become a very life-affirming

³⁹ See among numerous other distinguished contributions John Neubauer, 'Stimulation Theory of Medicine in the Fragments of Friedrich von Hardenberg', unpublished doctoral dissertation, Northwestern University, 1965; Walter D. Wetzels, 'Klingsohrs Märchen als Science Fiction', in: *Monatshefte*, 65 (1973), pp. 167–75; *Novalis und die Wissenschaften*, ed. by Herbert Uerlings, Tübingen 1997; Franziska Bomski, 'Die Mathematik im Denken und Dichten von Novalis. Zum Verhältnis von Liteartur und Wissen um 1800', unpublished doctoral dissertation, University of Freiburg/Breisgau, 2011.

individual indeed, identified with perhaps the most life-affirming (and equally ambivalent) individual in German literary history. He is in short ‘eine durch und durch Faustische Natur’, ‘wirklich ein Faust’ (p. IV). He possesses a ‘Sehnsucht’, indeed, but that is ‘als Faust die Welt zu durchstürmen, die Sehnsucht des Denkers nach Weltherrschaft ist mit darin’ (p. IV). This is the inner continuity which dissolves the tension between the poesy and the science: As a poet, he is a Faust, as Faust, he is a poet (p. IV). It is also this which links the Novalis biography here with the rhetoric of Bölsche’s two pastiche Goethe sermons, in particular the prominent term for frankly Darwinian conquest so prominent in those texts. Novalis’s ‘Grundstandpunkt’, we hear in his introduction to vol. 1 (*Gedichte, Die Christenheit oder Europa, Die Lehrlinge zu Sais*), is ‘Eroberung’ (I, ‘Einleitung des Herausgebers’, p. 10), he follows always ‘die alte Bahn der Eroberung’ (p. XXXIX). Like Goethe, Novalis is a ‘berufene[r] Dichter-Eroberer[...]’ (II, ‘Einleitung des Herausgebers’, p. 6). His mission, along with Friedrich Schlegel (who fails), is ‘die Welteroberung durch das Poetische’ (I, XX), “‘Welteroberung durch die Dichtung’” (p. XXXV). Novalis is qualified as an ‘Eroberer’ of poesy at least half a dozen more times in these 60 or 70 pages of paratextual material, more frequently than by any other epithet. And when he is not a Faust, he is an Alexander (pp. XX, XXII, XXIII) or even an Achilles (VII). Out of the winsome otherworldly youth, then, has emerged a Faust, Hardenberg the conqueror, an unrealised one, but a conqueror nonetheless, and a conqueror, if we recall the encoding, in the Faustian and Darwinian sense of the word, as the evolutionary engine of history, transporter of evolutionary natural and cultural progress to other domains of life: ‘ein Stück pulsierenden Lebens aus der Entwicklung der Menschheit’ (p. VII). Like Goethe’s, his time has now inevitably and evidently come.

Here, sedimented in Bölsche’s Darwinian discourse on Novalis (and Goethe) in the term ‘Eroberung’, is an adumbration of where Bölsche’s apparently softened and eroticised Darwinian appropriation of cultural history actually ends up. In 1917, Bölsche published an anthology of world explorers called *Neue Welten: Die Eroberung der Erde in Darstellungen*

großer Naturforscher.⁴⁰ True, neither Goethe nor Novalis feature. These are travel writings by Georg Forster, Hinrich Lichtenstein, Karl von den Steinen, Alfred Russel Wallace, Chamisso, Alexander von Humboldt and Darwin. But there is an introduction, designed obviously to interest the reader in ‘Naturforschung’, which reveals just what has become of Bölsche’s notion of evolutionary conquest in the intervening years. Here we encounter the familiar concept of progressive evolutionary humanity: humanity is that species which by definition crosses borders into new worlds, both inner and outer worlds. The occasion of further reflexion this time is Columbus, as conqueror of the New World, and this reflection offers as it were Bölsche’s anticipatory version of Stephen Greenblatt’s first contact debate.⁴¹ Bölsche identifies three phases of world conquest. The first is that of Columbus’s colonisers, the indigenous Indians. They, he immediately notes, are in truth not native at all. They are, notes Bölsche (clearly following Darwin’s precept of the monogenesis and subsequent scattering of the human species across the globe), merely the first colonisers of this territory, driven from their birthplace elsewhere across the surface of the globe by the same process which has created the various races (*Neue Welten*, pp. XII-XIII). They legitimise their invasion, insofar as they trouble to do so at all, by the given natural fact of their more adaptive and hence superior culture. Thus in his, the second phase of conquest, Columbus’s naively illegitimate act of invasion has a sort of saving grace: he is merely colonising the first colonisers. He too, of course, succeeds in virtue of a kind of main force: the natural fact of the higher cultural level of his race. Indeed this, Columbus’s higher level of cultural sophistication, can be argued (romantically) to be re-integrating all those races formerly scattered in the primeval event of competitive adaptation into a new, now dominant higher and universal culture. Now Bölsche, to his credit, regrets *expressis verbis* the procedure of colonisation by bloodbath (his image): ‘[es] kann die Art, wie [die Eroberer] das zunächst trieben, kaum eine reine Freude in

⁴⁰ *Neue Welten: Die Eroberung der Erde in Darstellungen großer Naturforscher*, ed. and introduced by Wilhelm Bölsche, Berlin, 1917.

⁴¹ Stephen Greenblatt, *Marvelous Possessions: The Wonder of the New World*, Oxford, 1991, pp. 52-85.

uns wecken' (p. XIII). But in a sense, says Bölsche, rapidly moving on, the Conquistadors were in truth guilty only of strategic blindness: 'so stieg, ihnen unbewußt, die neue Kulturmission damals gleichsam als blinder Passagier mit ihnen ans Land' (p. XIII). To say more is to lose touch with reality, to fail to accept the hard bargain into which we are forced by the inexorable and morally indifferent process of evolutionary natural and cultural progress:

Und auch diese Eroberung durch die in sich geschlossene, durch einheitliche Tradition gestählte, technisch und geistig absolut überragende asiatisch-europäische Oberkultur hat sich, wir wissen es alle, nicht mehr aufhalten lassen bis auf diesen Tag. Ihre Vollendung ist nur noch eine Frage der Zeit. Alle praktische Entdeckungs- und Kolonialgeschichte der letzten Jahrhunderte dient ihr. Ihr Ziel muß sein, die Menschheit im ganzen abermals bis in jeden Winkel zu durchdringen und in ihrem höheren Zeichen wieder zu vereinheitlichen, während sie zugleich die gesamte Erdennatur in noch unendlich viel vollkommenerem Maße zu einem einigen Werkzeug, Kraftschatz und Kulturgarten dieser Menschheit zu erschließen strebt, als jene erste Natureroberung auch nur zu ahnen wagte. Mag diese Eroberung bis heute noch nicht ganz gewisser harter Kampfumsdaseinzüge entbehren, mag sie, wie aller rasche und rücksichtslose äußere Entwicklungsfortschritt, in gewissem Maße auch Zerstörungen bedeuten, schwache Rassen zum Aussterben geführt, das liebliche oder erhabene Naturbild der Erde vielfältig umgestürzt und eigenmächtig erneuert haben (Kultur gegen Natur): so wissen wir doch alle, daß es das äußere aktive Leben der Menschheit ist, das auch hier unaufhaltsam fortflutet, eine eigene ältere Schicht und große Naturschichten nach dem ewigen ehernen Gesetz allen Fortschrittes wieder begraben für einen höheren Bau, und daß auch alle unsere tiefsten und edelsten Idealgüter zuletzt in ihrer eigenen Durchsetzungsmöglichkeit mit auf der gesteigerten Kraft ruhen, die durch diese neue umspannende Erdkultur gewonnen wird. (pp. XIII–XIV)

In fairness to Bölsche, it should be said that his third phase of conquest is in principle pacific, the communicative spread of ‘Naturforschung’ by the voyagers whose reports he collects in his volume, fruit of the foregoing less than pacific colonisation of the Earth (p. XVI). But the point is, rather, that we have here the ultimate *dispositif* of Bölsche’s cultural history: all-too-easy acquiescence in cultural and territorial colonialism and even racial extinction complacently legitimised by the construct of his amoral, pseudo-Faustian, pseudo-Darwinian evolutionary theory. Not perhaps something either Goethe, author for example of a wholly decentred notion of *Weltliteratur*, or Novalis, who for his part tried to define Germanness as individualised cosmopolitanism,⁴² might have sanctioned.

No, I am not saying that Bölsche is part of the drift, or alleged drift, of German Darwinian culture towards National Socialist ideology in someone like Alfred Rosenberg, although in his last years there are symptoms pointing in this direction. Rather, what I am saying is that we have here an object lesson in the risks to which our two cultures culture exposes us: the use of literary and philosophical discourses to project value onto otherwise value-free scientific discourses, which, like Darwinism, demand recuperation into some kind of value system. What we have here is something more like the Nietzschean recuperation of Darwinian theory, in (for example) *Die fröhliche Wissenschaft*,⁴³ the notion that the struggle for life is really an epiphenomenon of the Will to Power. If so, this in truth represents a narrowing of Bölsche’s own interpretation of Darwinian evolution, reminding us of the points made by John Dupré against Richard Dawkins in our own day. Dawkins argued that the process of evolution was regulated by the ruthless (hypostasized) selfishness of the gene, programmed merely to reproduce itself at all costs; and thus vindicated the narrow interpretation of Darwinism’s struggle for life as Hobbesian or Malthusian war of all against all. Against this, Dupré rightly

⁴² See Hendrik Birus, ‘Goethes Idee der Weltliteratur: Eine historische Vergegenwärtigung’, in *Weltliteratur heute: Konzepte und Perspektiven*, ed. by Manfred Schmeling, Würzburg, 1995, pp. 5–28; also Novalis’s letter to A.W. Schlegel of 30 November 1797, in Novalis, *Schriften: Historisch-kritische Ausgabe*, ed. by Paul Kluckhohn, Richard Samuel et al., 6 vols, Stuttgart, 1960, IV (1975), p. 237.

⁴³ *Die fröhliche Wissenschaft* (1882), in: Friedrich Nietzsche, *Werke*, ed. by Karl Schlechta, Munich, 1954–6, II, pp. 7–274. (p. 215, No. 349).

held that the notion of struggle in Darwin also tended to generate often altruistic co-operation in and between species, and so is actually the source of all the social virtues.⁴⁴ Around 1900 Bölsche himself ventilates these arguments, and *Das Liebesleben in der Natur* is of course one expression of his own earlier, more generous philosophical appropriation of Darwinian evolution.⁴⁵

There is something to be learned from Bölsche's engagement with the two cultures issue beyond the familiar lessons of mid-twentieth-century German history. The lesson is not only that the two cultures problem has not gone away, but that the relationship between them has moved on and changed the terms of engagement from those around 1900. We all had to be reminded of the urgency of the issue by Joseph Carroll's literary Darwinist polemics.⁴⁶ Carroll deployed arguments and applications which were more or less persuasive. Like Bölsche, he in my view rightly argued (Carroll, pp. ix–xii) that we in the humanities ignore at our peril the well-founded cultural prestige of the natural sciences. In particular, he took the view that the problem lay on the humanities side, the cause being the humanities' defensive retreat into epistemological isolation and isolationism as the sciences grew dominant. The symptom of this for Carroll was the radical autonomy claimed by both humanities and social sciences in their epistemological models, as self-referential epistemological constructs which by definition could not be related to the observationally founded and experimentally tested theories in the science faculty, which protected their enterprise (solipsistically at least), but also begged the question of their own utility and relevance for the wider human project. Some of those who laboured with unrewarded good will over some of the more abstruse theoretical constructs of the 1960s and 1970s may, despite all solidarity with those projects, sympathise to this extent with Carroll's polemic, even if we do not sympathise with Carroll's main

⁴⁴ Richard Dawkins, *The Selfish Gene*, Oxford 1976; John Dupré, *Darwin's Legacy: What Evolution Means Today*, Oxford, 2005.

⁴⁵ Compare too Bölsche's 'Ist die gegenseitige Hilfe ein Grundprinzip der organischen Entwicklung?', in: W.B., *Stirb und Werde! Naturwissenschaftliche und kulturelle Plaudereien*, Jena, 1913, pp. 135–53, and *Schutz und Trutzbündnisse in der Natur*, Stuttgart, 1917.

⁴⁶ Notably Joseph Carroll, *Literary Darwinism: Evolution, Human Nature, and Literature*, London, 2004.

remedy, which reminds us too readily of naturalism: the total subjugation of the humanities project to the master discourse of the sciences. But this easy critique of Carroll misses the hard hidden point of Carroll's own strategic blindness, which is to misrecognise that the undoubted autonomy of aesthetic discourse is in fact its redemption – a point that Bölsche clearly saw. For aesthetic autonomy, far from being by choice isolationist, of course *also* offers, from a Foucauldian perspective, an indispensable standpoint from which otherwise dominant discourses can freely be cited, analysed and criticised.⁴⁷ More innovatively, of course, the humanities need to recognise (as Bölsche did in other texts) that the dualism of arts and sciences itself is an abstract construct. Yes, sciences operate by definition with their rigorous experimental methodology. But all sciences are to some extent dependent on representative and communicative forms. We cannot imagine Darwin's theory without a narrative that compresses deep time into something the human mind can frame. Bölsche certainly thought that Darwin (as narrative virtuoso) was half an artist, and Gillian Beer agreed with him.⁴⁸ And scientists are at least as dependent as humanities specialists upon (methodologically insecure) cognitive metaphors for the disclosing of theoretical advances. More significant, finally, humanities scholars can work consiliently with, rather than against scientific methodologies without in some sense betraying their discipline by disregarding after all the sacred doctrines of literary autonomy and hermeneutic authority. Of course texts are autonomous, at least in one dimension of their generation of meaning. But this is not to stop us for example working with evolutionary and cognitive experimental psychologists to establish scientifically grounded laws of reading competence based in the structure of the brain and measured against evolutionary adaptational advantage, for these too assist in the

⁴⁷ See Simon During, *Foucault and Literature: Towards a Genealogy of Writing*, London, 1992, pp. 92–118.

⁴⁸ On this: Nicholas Saul, "[...] im dunkeln Drange immer auf *ein* Ziel los". Wilhelm Bölsche als Darwin-Biograph', in Susen/Edith Wack (eds.), *'Was wir im Verstande ausjäten'* (note 1), pp. 343–359; Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*, Cambridge, 1983.

traditional hermeneutic enterprise of releasing the text's meaning.⁴⁹ Equally, those who disparage the possible utility of big data analysis for releasing significance (as demonstrated e. g. by Katherine Hayles, Fotis Jannidis and Gerhard Lauer, and Jamie Tehrani)⁵⁰ should recognise that big data holds the capacity for the digital reading of more texts than any human ever could; some surprising things can be discerned through attending to the statistical analysis of several thousand novels around 1800; and the evolution of Grimms' *Märchen* can be discerned in the phylogeny of *Rotkäppchen*.

⁴⁹ For example, on narrative coherence: Márta Horváth, 'Der Drang nach Kohärenz: Kohärenzstiftende kognitive Mechanismen beim Lesen fiktionaler Erzähltexte', in: *Universalien? Über die Natur der Literatur*, ed. by Endre Hárs, Márta Horváth, Erzsébet Szabó, Trier, 2014, pp. 47–62.

⁵⁰ N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics*, Chicago, 1999; N.K.H., *Electronic Literature: New Horizons for the Literary*, Notre Dame, 2008; Fotis Jannidis and Gerhard Lauer, 'Burrows's Delta and Its Use in German Literary History', in: *Distant Readings: Topologies of German Culture in the Long Nineteenth Century*, ed. by Matt Erlin and Lynne Tatlock, Rochester, 2014, pp. 29–54; Jamshid J. Tehrani, (2013) 'The Phylogeny of Little Red Riding Hood' <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0078871> (accessed 18 October 2014).